Smart Home Automation System by using Internet of Things

Prasad R. Patil[1] Mandar B. Alase[2] Bhanudas A. Madival[3] Harshvardhan S. Mahamuni[4] Pooja K. Akulwar[5]

[1,2,3,4]B.E Student [5]Assistant Professor

[1,2,3,4,5]Department of Computer Science & Engineering

[1,2,3,4,5]Sanjay Ghodawat Group of Institutions, Shivaji University, Kolhapur, India

Abstract— Internet of Things (IoT) is a concept of imagines all objects around us as part of internet. IoT includes the very wide range of objects and variety of objects like smart phones, tablets, digital cameras and sensors. In the IoT All these devices are connected to each other, they enable more smart services and processes that support our everyday needs, environment and health. The current revolution in Internet, mobile, and machine-to-machine technologies can be seen as the first phase of the IoT. Arduino Mega controller is used as a controller to control and monitor many applications through server. Status of every device is continuously monitored on webpage and user can use this data to switch the device. MQTT (message queue telemetry transport) protocol is used for communication of data. It was designed as an extremely lightweight publish/subscribe messaging transport the communication between the controller and devices is achieved by putting both the systems in the same network using Ethernet shield, mounted on the Arduino. IoT applications that use real-time sensor values to optimize business processes, improve the quality of life, or increase safety in critical environment.

Key words: IoT, Arduino, Smart Home, Common Infrastructure

I. INTRODUCTION

In home automation system internet access can be used to control from any distance. Last few years, internet is not used only for the surfing pages, searching information, downloading software's but, now days, Advancement of technology is forcing to make interaction internet with machineries and devices. In the present times, we can find most of the people attached with mobile phones and smart devices. Hence with the help a mobile phone, some daily household tasks can be accomplished by personifying the use of the mobile phone. To develop an automatic control system that helps in controlling or access devices either through one or many computer either mobile based application on mobile. Home automation is providing security and comfortable for dwellers. It automatically turns lights on and off in closets, stairways, and other places. Devices consume less power which is used in home automation. Hence, it saves energy. The IoT, in reality, has been around for a long time, but it didn't have a name. Machine-to-machine communications has been in existence for many decades, often using dedicated networks that eventually converged. It is most popular processing platform and wireless communication technology to connect devices and systems to the Internet using sensors. IoT technology can be used for smart homes to provide intelligence, comfort and to improve the quality of life.

II. BLOCK DIAGRAM WITH DESCRIPTION

1) LPG gas detection: This Insight covers a methane gas sensor that can sense gases such as ammonia which might get produced from methane. When a gas interacts with this sensor, it is first ionized into its constituents and is then adsorbed by the sensing element.
2) Main door security system: Ultrasonic sensor uses piezoelectric principle. Piezoelectric ultrasonic sensors use a piezoelectric material to generate the ultrasonic waves. Ultrasonic sensors are devices that use electrical–mechanical energy transformation to measure distance from the sensor to the target object.
3) Light intensity control: A light dependent resistor working on the principle of photo conductivity. Photo conductivity is an optical phenomenon in which the materials conductivity> (Hence resistivity) reduces when light is absorbed by the material.
4) Water level & Garage Door: For this application Ultrasonic sensor can be used. It works on the piezoelectric principle. Piezoelectric ultrasonic sensors use a piezoelectric material to generate the ultrasonic waves.

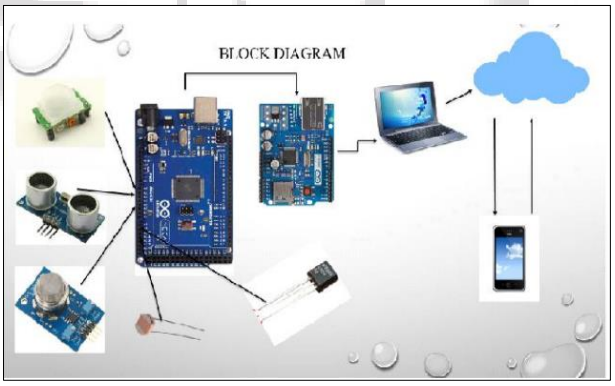

Fig. 1: Block Diagram

III. METHODOLOGY

A. *Ethernet Shield:*

The Arduino Ethernet Shield can be easily connected to your Arduino to the internet. This shield enables your Arduino to send and receive data, from anywhere in the world by using internet connection. You can control robots remotely from a website. For the internet connection, The Arduino Ethernet Shield can be allows to Arduino. It is based on the Wiznet W5100ethernet chip. The Wiznet W5100 provides a network (IP) to TCP and UDP. It can support four simultaneous socket connections. Ethernet library used for to write sketches which connected internet using the shield.

IV. SYSTEM DESIGN

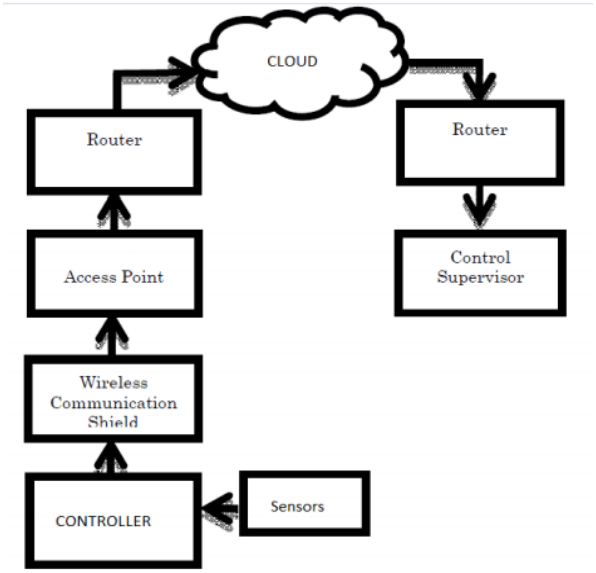

Fig. 2: System Flowchart.

Initially data or status of the device is seen or monitored through webpage via internet and according to every user requirements devices can be controlled. Different values from the sensors are obtained interfaced with the controller then as per conditions put by the user it will monitor and control the device.

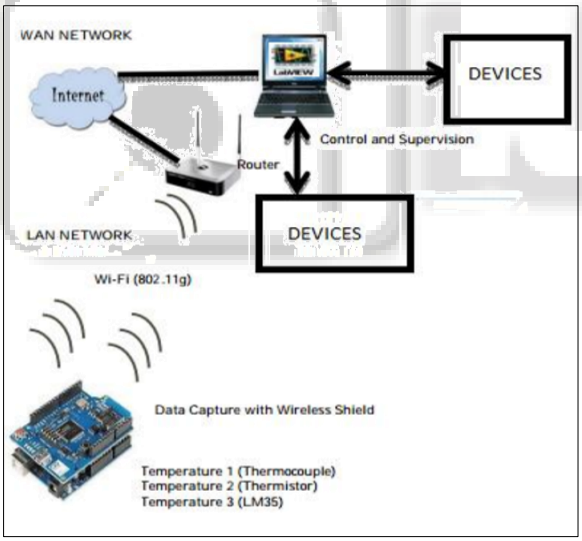

Fig. 3: Real Topology

V. CONCLUSION

People can control their electrical devices like's lights, fans or other electrical appliances via these Home Automation devices and set up the controlling actions in the smart phone. By using Home automation system we can manage cost, flexible and energy efficient smart homes. We think this product have high potential for marketing in the future. At the moment the components are a bit to high to be able to produce these devices for a interesting price. The extensive capabilities of this system are what make it so interesting. The end product will have a simple design making and it is easy for users.

ACKNOWLEDGMENT

It gives us great pleasure to present this survey report on "Smart Home Automation System by Using Internet of Things". We would like to take this opportunity to thank our internal guide Assistant Professor Pooja Akulwar and Head of Department Dr. B. C. Melinamath for giving us all the help and guidance we needed. We are really grateful to them for their kind support. Their valuable suggestions were very helpful.

REFERENCES

[1] Vishwajeet Hari Bhide, Dr, Sanjeev Wagh "i-Learning IoT: An Intelligent Self Learning System for Home Automation Using IoT", International Conference on Communication and Signal Processing, April 2-4, 2015, India.
[2] H. Brooke Stauffer "Smart Enabling System for Home automation", IEEE Transactions on Consumer Electronics, Vol. 37(2), pp. 29-35, 1991.
[3] Eddie M C Wong, "A Phone Based Remote Controller for Home and Office Automation", IEEE Transactions on Consumer Electronics, Vol. 40(1), pp. 28-34, 1994.
[4] Kallakunta. Ravi Kumar, Shaik Akbar "Android Application Based Real Time Home Automation." Indian Journal of Applied Research ISSN 2249-555X.
[5] Basma M. Mohammad El-Basioni1, Sherine M. Abd El-kader2 and Mahmoud Abdelmonim Fakhreldin3, "Smart Home Design using Wireless Sensor Network and Biometric Technologies" at Volume 2, Issue 3, March 2013.
[6] N.-S. Liang, L.-C. Fu, and C.-L. Wu, "An integrated, flexible, and Internet-based control architecture for home automation system in the Internet era," in IEEE International Conference on Robotics and Automation, Washington, DC 2002, pp. 1101 - 1106
[7] Sharon Panth, Mahesh Jivani "Home Automation System (HAS) using Android for Mobile Phone", International Journal of Electronics and Computer Science Engineering ISSN 2277-1959/V3N1-01-11.

